Name: Date:

Polynomial Factoring solution (version 22)

1. **The quadratic formula says if $ax^2 + bx + c = 0$ then $x = \frac{-b \pm \sqrt{b^2-4ac}}{2a}$. Use the quadratic formula to solve the following equation.**

$$x^2 - 8x + 24 = 0$$

Simplify your answer(s) as much as possible.

Solution

$$x = \frac{-(-8) \pm \sqrt{(-8)^2 - 4(1)(24)}}{2(1)}$$

$$x = \frac{-(-8) \pm \sqrt{64 - 96}}{2(1)}$$

$$x = \frac{8 \pm \sqrt{-32}}{2}$$

$$x = \frac{8 \pm \sqrt{-16 \cdot 2}}{2}$$

$$x = \frac{8 \pm 4\sqrt{2}\, i}{2}$$

$$x = 4 \pm 2\sqrt{2}\, i$$

Notice that i in NOT under the square-root radical symbol!!

2. **Express the product of $6 + 4i$ and $8 + 5i$ in standard form $(a + bi)$.**

Solution

$$(6 + 4i) \cdot (8 + 5i)$$

$$48 + 30i + 32i + 20i^2$$

$$48 + 30i + 32i - 20$$

$$48 - 20 + 30i + 32i$$

$$28 + 62i$$

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3. **Write function $f(x) = x^3 + 10x^2 + 27x + 18$ in factored form. I'll give you a hint: one factor is $(x + 3)$.**

Solution

	1	10	27	18
-3		-3	-21	-18
	1	7	6	0

$$f(x) = (x+3)(x^2+7x+6)$$

$$f(x) = (x+3)(x+6)(x+1)$$

4. **Polynomial p is defined below in factored form.**

$$p(x) = (x+7)^2 \cdot (x+4)^2 \cdot (x-1) \cdot (x-4)^2$$

Sketch a graph of polynomial $y = p(x)$.